

Claims

13. A rotating electric machine for high-voltage operation, comprising:

a stator;

a rotor disposed within said stator;

a set of windings having high-voltage cables that enclose an electric field in the set of windings, said set of windings having an end winding region; and

a fault current control device including,

an elongated member of an electrically conducting material connected to ground and disposed in the end winding region.

14. The rotating electric machine of Claim 13, further comprising:

other elongated members positioned in the end winding region such that a maximum distance between respective of the elongated member and the other elongated members being sufficiently small to deflect to ground an arc originating in the end winding region.

15. The rotating electric machine of Claim 14, wherein:

said elongated member and said other elongated members being inserted a predetermined distance into the end winding region, said predetermined distance being limited such that eddy currents produced in said elongated member and said other elongated members being below a predetermined magnitude.

16. The rotating electric machine of Claim 13, wherein:

said elongated member being slotted so as to reduce eddy-current losses.

17. The rotating electric machine of Claim 13, wherein:

said elongated member including a plurality of small conductors combined into a bundle having a cross-sectional area of sufficient size to deflect short-circuit currents arising in the end winding region during a fault event.

18. The rotating electric machine of Claim 13, further comprising:

a spacer made of resilient, electrically conducting material, said spacer being applied between said elongated member and another elongated member in the end winding region and positioned to contact respective outer semi-conducting layers of the high-voltage cables.

19. The rotating electric machine of Claim 18, wherein:

said elongated member being inserted into the spacer.

20. The rotating electric machine of Claim 18, further comprising:

other spacers, said elongated member being in contact with said spacer and said other

spacers, said spacer and said other spacers being arranged one after another in a direction toward an end of the stator.

21. The rotating electric machine of Claim 13, wherein:

said fault current control device comprising a flexible wire.

22. The rotating electric machine of Claim 13, wherein:

said fault current control device being configured to mechanically stabilize the set of windings in the end winding region.

23. The rotating electric machine of Claim 13, wherein:

each of said high-voltage cables being flexible and having at least one current-carrying conductor disposed within an inner layer of material having semiconducting properties, said inner layer being disposed within a solid insulating part, said solid insulating part being disposed within an outer layer material having semiconducting properties.

24. The rotating electric machine of Claim 13, wherein:

said windings being configured to carry a voltage of at least 36 kV.

25. The rotating electric machine of Claim 24, wherein:

said winding being configured to operate in an inclusive high-voltage range of 400 kV through 800 kV.

26. A rotating electric machine for high-voltage operations, comprising:

a stator;

a rotor disposed in said stator;

a set of windings having high voltage cables enclosing an electric field within the windings; and

means for controlling a fault current and for conducting said fault current to ground in an end winding region of said set of windings.